



## PATENT ABSTRACTS OF JAPAN

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KUWAZUKA HARUHIKO  
MIKAWA TAKASHI****(54) MANUFACTURE OF SEMICONDUCTOR LIGHT  
RECEIVING ELEMENT**

as well of the substrate 101.

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**(57) Abstract:**

**PURPOSE:** To form a favorable guard ring even with an ultrahigh-speed avalanche photodiode by introducing one conductivity type of impurities into the position corresponding to the guard ring of semiconductor for a low-field layer, and then, forming a semiconductor layer of an opposite conductivity type of window layer of the same band gap as that and in low concentration.

**CONSTITUTION:** A buffer layer 102, a light absorbing layer 103, a hetero lightening layer 104, a low-field layer 105, and a cap layer 106 are epitaxially grown in this order on a substrate by vapor growth method, or the like. With the resist pattern 107 made hereon as a mask, p-type impurities are implanted by ion implantation. The cap layer 106 ( region 108) is removed by selective etching, and a window layer 109 and a cap layer 110 are grown. A cap layer 110 is removed, and with an SiN film 111 as a mask, a p+-type region 112 is formed in the window layer 109. Furthermore, an SiN film 113 being a nonreflective film and an electrode (Au/Zn) 114 are formed, and an electrode (AuGe) 115 is made at the rear,

